

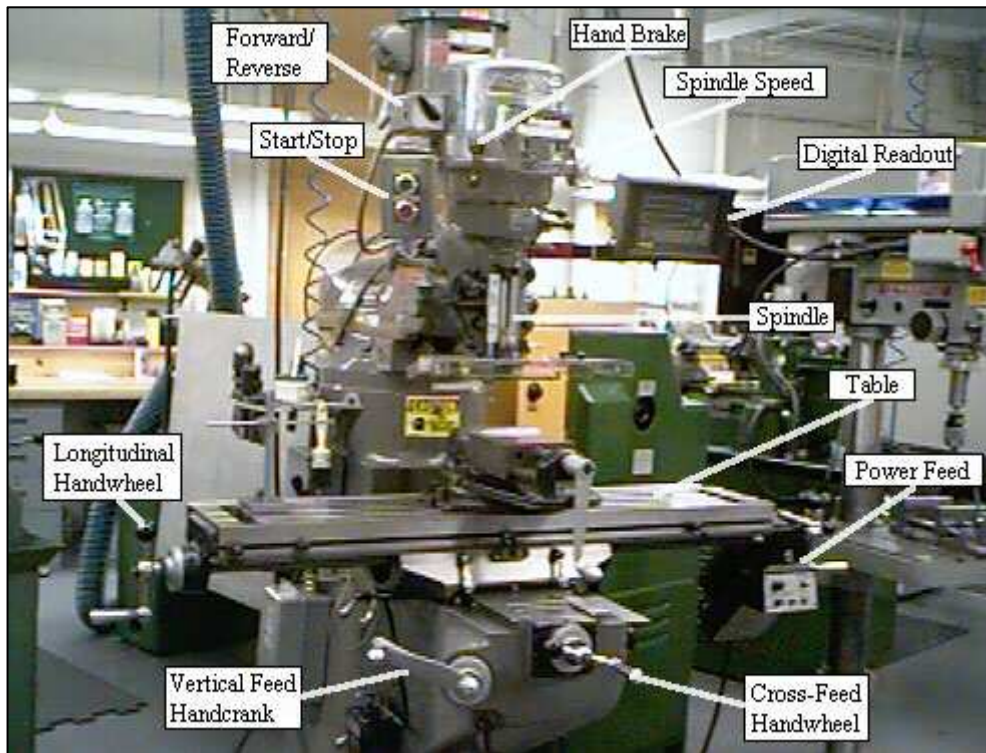
Fayoum University
Faculty of Engineering
Department of Industrial Engineering

Report about/ **Vertical Milling Machine**



محمد عبد الغنى عبد السلام عبد الجليل	الاسم
الفرقة الأولى	الفرقة

Vertical Milling Machine



The Milling Machine uses a rotating milling cutter to produce machined surfaces by progressively removing material from a work piece. The vertical milling machine also can function like a drill press because the spindle is perpendicular to the table and can be lowered into the work piece.

THE CONTROLS/

START/STOP:

The green button starts the spindle motor and the red button shuts the motor off.

FORWARD/REVERSE:

This switch changes the rotation direction of the spindle. When the milling machine is in high range this switch is in the forward position for cutting but in low range the switch is in the reverse position. Putting the switch in the opposite position while remaining in the same range reverses the rotation of the spindle.

SPINDLE SPEED:

This wheel is used to change the speed of the spindle for both high range and low range. The milling machine must be running when changing the speed.

**HAND BRAKE:**

Also known as the spindle brake, it is used to bring the spindle rotation to a stop after the power is turned off and to aid in removing collets and chucks. The spindle can be locked by pressing or pulling the brake and then pushing it up.

POWER FEED:

The power feed uses a motor to control the motion of the longitudinal feed in either direction at various speeds. Not all of the milling machines in the shop have this option.

CROSS-FEED HANDWHEEL:

This handwheel moves the table in and out.

VERTICAL FEED HANDCRANK:

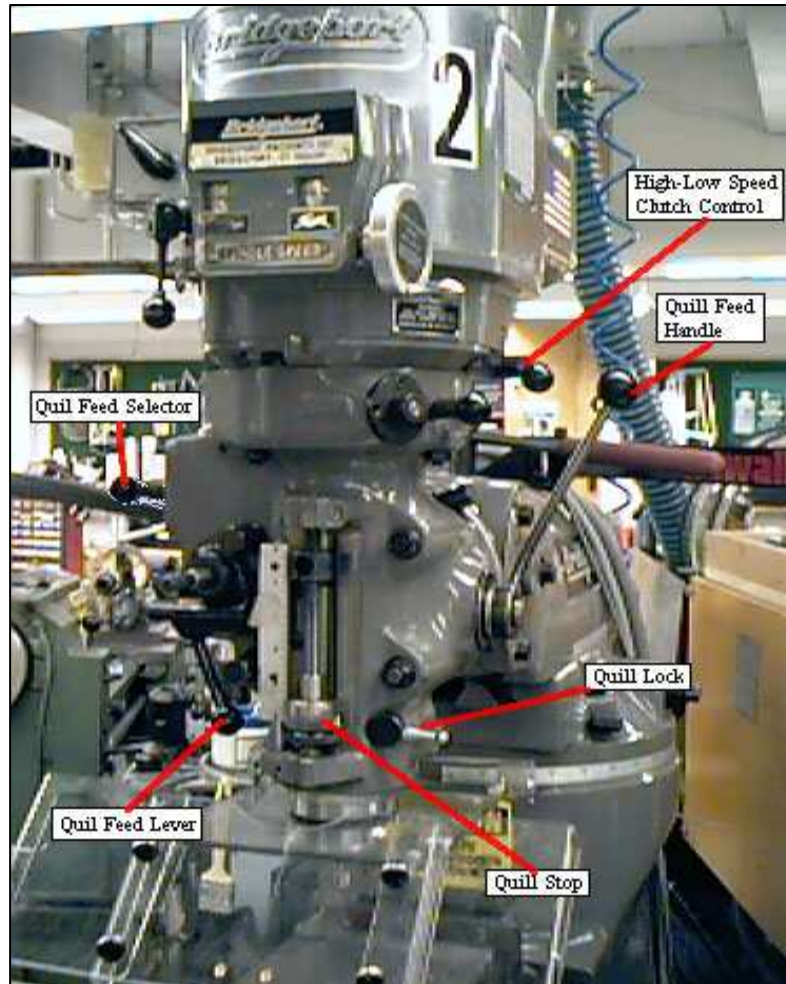
This is used to raise and lower the table.

LONGITUDINAL HANDWHEEL:

This handwheel moves the table left and right. On some machines the handles are spring activated to keep them from rotating when the power feed is used.

HIGH-LOW SPEED CONTROL:

The high-low speed switch changes the range from high to low and vice-versa. The spindle may need to be turned by hand while engaging the gears.



QUILL FEED HANDLE:

You can raise and lower the quill (spindle) with this handle.

QUILL LOCK:

Pushing this lever down will lock the quill, pulling it back up releases the lock. The quill must be locked when milling.

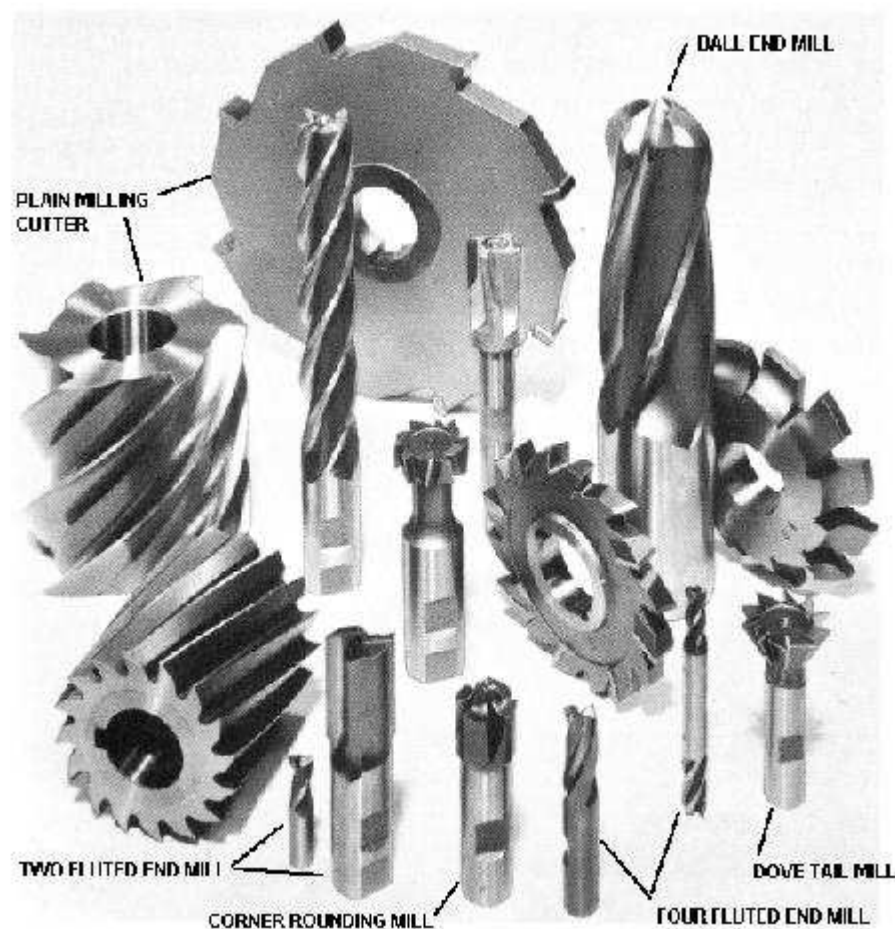
QUILL STOP:

The quill stop can be adjusted by hand to set a limit on the quill travel is also used to disengage the quill feed. This is useful when multiple holes have to be drilled to the same depth.

QUILL FEED LEVER AND SELECTOR:

These are used to activate the power feed for the quill. The selector will adjust the speed of the power feed and the lever activates the drive. The quill feed can

Types of Milling Cutters/



Basic Cutter Styles and Their Application/

Staggered tooth side milling cutters have 10 degree positive radial rake and 10 degree positive axial rake (helix), right and left hand on alternate teeth. The alternate side tooth design provides additional chip space allowing deep slotting. These cutters are ground with clearance and slight concavity on the side to avoid having the side tooth drag in the cut. The positive axial and radial rake design, with alternate side teeth cutting, makes the staggered tooth cutter a free cutting tool with excellent chip disposal characteristics. Long side tooth design permits greater latitude for modification, provides more regrinds, and economical regashing. The raised land allows numerous resharpenings without requiring a secondary clearance grind. All style "S" staggered tooth cutters with the same number of teeth and arbor hole interlock regardless of diameter. There are 442 standard staggered tooth cutters that provide a width selection ranging from .170 - 1.250 in decimal or metric size . There are 18 diameters which may be economically modified to provide decimal or metric diameters within the range listed in Chart A. The same cutter, therefore, may be used for a variety of applications in combination with other cutters in a gang, or singly for

slotting or straddle milling, interlocked for special width slots, interlocked for plain milling covering an infinite width, interlocked for step milling. The number of possible combinations is unlimited. Standardization with off the shelf cutters reduces inventory, eliminates long deliveries, reduces down time and subsequently lowers total tool costs.